



ST. LOUIS COUNTY BOARD OF ADJUSTMENT STAFF REPORT

INSPECTION DATE: 6/18/2024

REPORT DATE: 6/21/2024

MEETING DATE: 7/11/2024

APPLICANT INFORMATION

APPLICANT NAME: Adam and Julie Ryan

APPLICANT ADDRESS: 10440 Highway 92, Hibbing, MN 55746

OWNER NAME:
(IF DIFFERENT THAN ABOVE)

SITE ADDRESS: 4301 Isle of Pines, Tower, MN 55790

LEGAL DESCRIPTION: Lot 001, Block 001, Isle of Pines Town of Greenwood, S3, T62N, R16W (Greenwood)

PARCEL IDENTIFICATION NUMBER (PIN): 387-0215-00010

VARIANCE REQUEST: The applicant is requesting relief from St. Louis County SSTS Ordinance 61 adopted Technical Standards 7080.2150, Subpart 2 (F), to allow a subsurface sewage treatment system installation at a reduced shoreline setback.

PROPOSAL DETAILS: The applicant is proposing a replacement subsurface sewage treatment system that consists of peat filters at a reduced setback of 40ft to lake Vermilion, where 50ft is required from a general development lake. The proposed system is replacing a failing system.

PARCEL AND SITE INFORMATION

ROAD ACCESS NAME/NUMBER: Isle of Pines Dr.

ROAD FUNCTIONAL CLASS: Private

LAKE NAME: Vermilion Lake

LAKE CLASSIFICATION: GD

RIVER NAME: N/A

RIVER CLASSIFICATION: N/A

DESCRIPTION OF DEVELOPMENT ON PARCEL: Current development consists of a dwelling, two storage sheds, a sleeper cabin, failed septic system, and driveway.

ZONE DISTRICT: RES 8

PARCEL ACREAGE: 0.4 ACRES

LOT WIDTH: 88 FEET

FEET OF ROAD FRONTAGE: 88 FEET

FEET OF SHORELINE FRONTAGE: 285 FEET

PARCEL AND SITE INFORMATION

VEGETATIVE COVER/SCREENING: Adequately screened from lake and adjacent properties.

TOPOGRAPHY: The proposed area for the septic is generally flat, however elevation outside area to the lake is steep slope.

FLOODPLAIN ISSUES: Parcel contains mapped floodplain, proposed septic location will be outside floodplain area and meet FEMA floodplain requirements.

WETLAND ISSUES: N/A

ADDITIONAL COMMENTS ON PARCEL:

FACTS AND FINDINGS

A. Official Controls:

1. Ordinance 61 and technical standards states that septic systems shall meet setbacks as required in section 7080.2150, subpart 2, item F, table VII. The table requires a 50 foot setback from a general development lake and the applicant is requesting a 40 foot setback.

B. Practical Difficulty:

1. The lot is 0.4 acres with an irregular shape, a large amount of shoreland, and bedrock in multiple areas which limits soil treatment location.
2. An alternative that would not require a variance may be holding tanks in the front yard, however; this would require blasting into the bedrock, in addition to year round pumping as the applicant hopes to live here.

C. Essential Character of the Locality:

1. The area consists of developed lakeshore lots containing both conforming and nonconforming seasonal and year round homes.
2. There have been no similar septic variance requests in the area.

D. Other Factor(s):

1. The existing septic system is noncompliant and located within the right of way and shoreline setback.

BOARD OF ADJUSTMENT CRITERIA FOR APPROVAL OF A VARIANCE

1. Is the variance request in harmony with the general purpose and intent of official controls?
2. Has a practical difficulty been demonstrated in complying with the official controls?
3. Will the variance alter the essential character of the locality?
4. What, if any, other factors should be taken into consideration on this case?

CONDITIONS

Conditions that may mitigate the variance for relief from St. Louis County SSTS Ordinance 61 adopted Technical Standards 7080.2150 Subpart 2 (F) to allow the replacement of a subsurface sewage treatment system at a reduced shoreline setback as proposed include, but are not limited to:

1. All other Onsite Wastewater SSTS standards shall be met.
2. Following system installation, an inspection shall be performed by a qualified inspector to ensure setbacks are met prior to issuing Certificate of Compliance.
3. All other local, county, state and federal regulations shall be met.



St. Louis County, MN

VARIANCE

Variance Worksheet

Subsurface Sewage Treatment System

Form

3090

Rev. 03-2021

About SSTS Variances Pursuant to Ordinance 61, Article V, Section 3.0

A property owner may request a variance from the standards specified in the Ordinance pursuant to county policies and procedures. Variances shall only be permitted when they are in harmony with the general purposes and intent of this Ordinance where there are practical difficulties or particular hardship in meeting the strict letter of this Ordinance, excluding the technical standards. Certain deviations may require the approval of the MPCA or the MN Department of Health.

Please Complete the Following Sections

Describe the specific provision or provisions in the ordinance from which the variance is requested.

A variance is being requested to allow for a septic system to be installed within 40' of the high water mark instead of the ordinary statute of 50' on lake Vermilion.

Describe the practical difficulty that prevents compliance with the rule.

The lot was platted in an irregular shape which makes staying away from the lake on two sides difficult. There is also a large amount of bedrock in the front yard, which eliminates a large portion from being able to have a septic.

Describe the alternative measures that will be taken to achieve a comparable degree of compliance with the purposes and intent of the applicable provisions.

By allowing the system to be closer to the lake, we would be able to maintain the proper setbacks to the neighbor's property line as well as the setbacks to the cabin. Without the variance, the system would have to become smaller and would encroach onto the neighbor's property line, as well as the cabin.

Identify cost considerations preventing reasonable use of the property under the terms of this ordinance.

The only other option for a system on this site would be to put in holding tanks either in the front or back yard. If this were to be a year around home, there would be significant pumping expenses accrued. Getting holding tanks in the front yard would also require blasting in order to get the tanks in.

AGREEMENT

By submitting this request for variance from the Ordinance and the Construction Standards, I certify and agree that no substantial health hazard is likely to occur therefrom and an unnecessary hardship might result in strict compliance with the Ordinance and Standards. I further agree to install a sewage treatment system in accordance with the permit application, plans, and specification that are made as part of this variance request, in addition to paying the Variance Fee associated with this request.

Site Design of Septic 5/2/2024

4301 Isle of Pines Dr.

Township: Greenwood

+/- 0.54 acres

City: Tower

Designed by Michael Bodri

Bodri Enterprises Inc.

License 4284 Cert 8748

218-410-3477

Proposed well

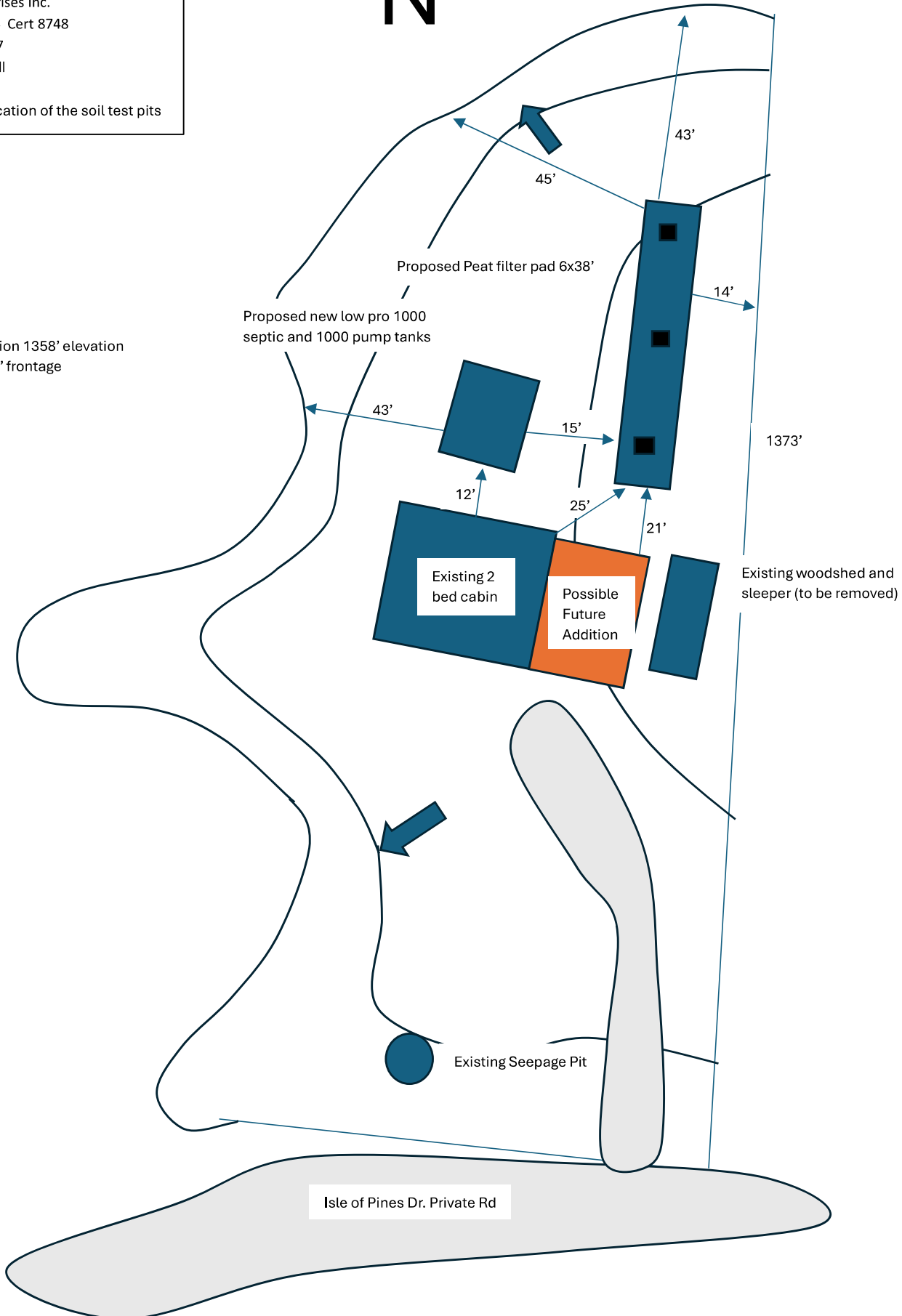
Not to scale

■ -The location of the soil test pits



Neighbor to the East has a lake water system as of 5/2/2024

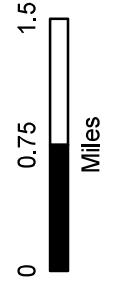
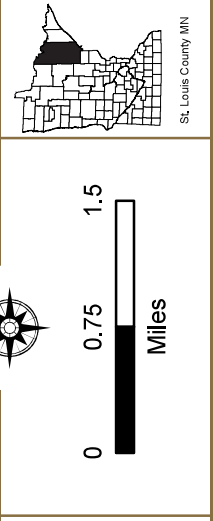
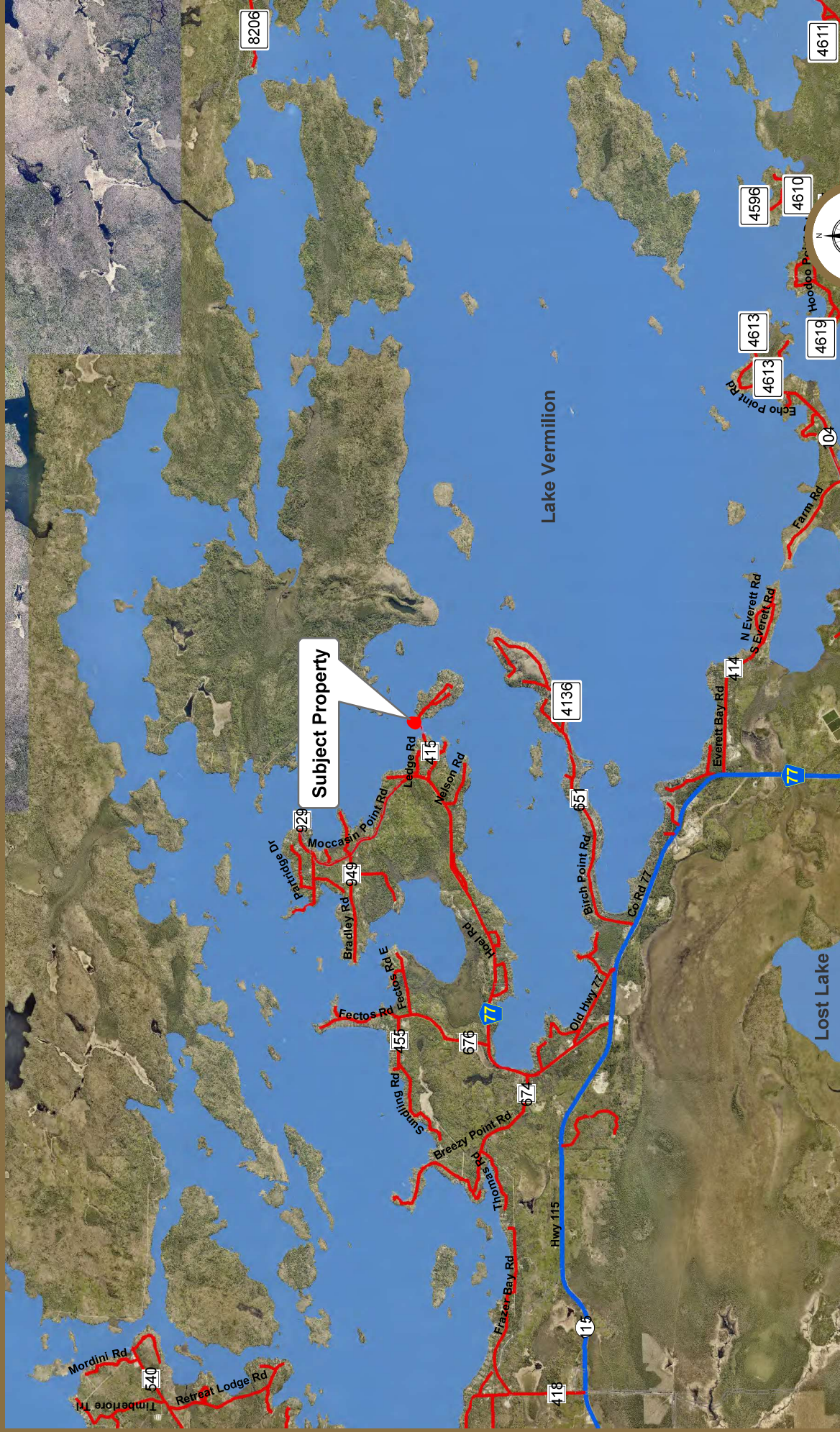
Lake Vermilion 1358' elevation approx. 360' frontage



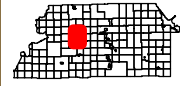


St. Louis County

July BOA Meeting



Adam Ryan Location Map 387-0215-00010



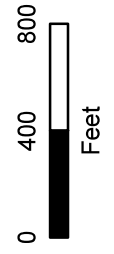
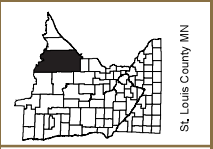
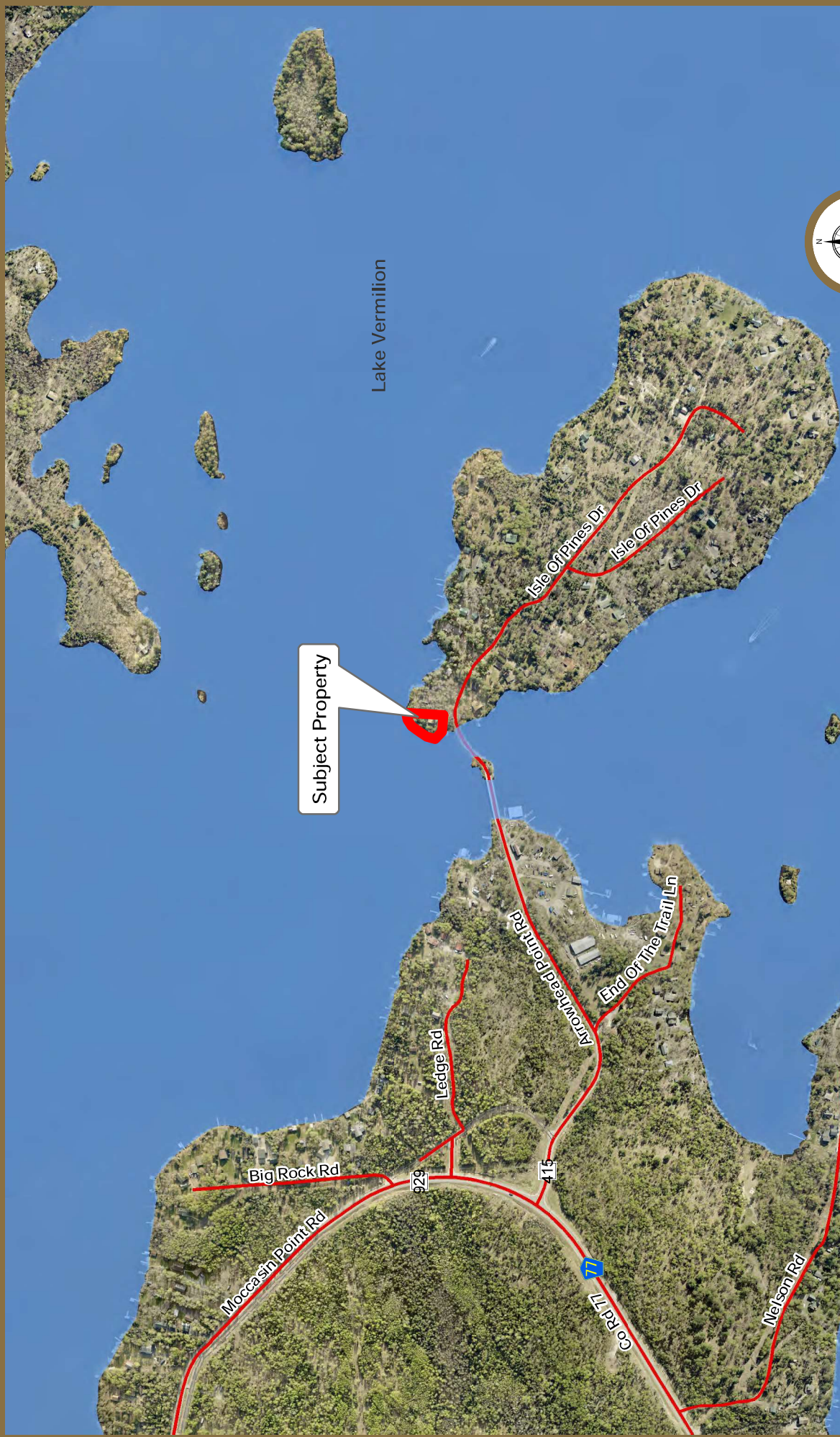
Prepared By: **Planning & Zoning**
Department
(218) 725-5000
www.stlouiscountrymn.gov
Source: St. Louis County
Map Created: 6/13/2024

Disclaimer: This is a compilation of records as they appear in the St. Louis County Offices affecting the area shown. This drawing is to be used only for reference purposes and the County is not responsible for any inaccuracies herein contained.

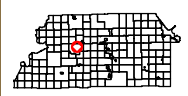
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St. Louis County

July BOA Meeting



Adam Ryan
Location Map
387-0215-00010



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 Department
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0 400 800
Feet

Adam Ryan

Zoning Map

387-0215-00010

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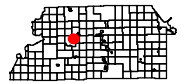
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St. Louis County

July BOA Meeting



Lake Vermilion

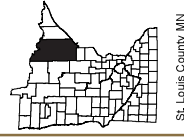


Prepared By: Planning & Zoning
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St. Louis County MN

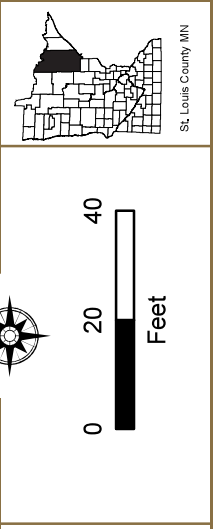
Adam Ryan
Site Map
387-0215-00010

St. Louis County

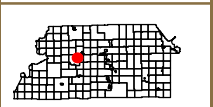
July BOA Meeting



Lake Vermillion



Adam Ryan Elevation Map 387-0215-00010



Prepared By: Planning & Zoning
Department
(218) 725-5000
www.stlouiscountymn.gov

Source: St. Louis County

Map Created: 6/13/2024

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St. Louis County, MN

PERMIT

Residential Construction Application

Subsurface Sewage Treatment System

Form

3000

Rev. 01-02-2024

This permit application form is used to apply for a Permit to Construct. Additional Information: www.stlouiscountymn.gov/septic.

PROPERTY IDENTIFICATION NUMBER (PIN) and SITE

Primary PIN **3 8 7 - 0 2 1 5 - 0 0 0 1 0** Associated PIN **- - - - -**

PIN is found on your Property Tax Statement (E.g. 123-1234-12345), searching the County Land Explorer at <https://gis.stlouiscountymn.gov/landexplorer/>, or searching the Property Lookup at <http://apps.stlouiscountymn.gov/auditor/parcelInfo2005Iframe/>.

Site Address **4301 Isle of Pines Dr.** City **Tower** Zip **55790**

Check to request a 911 address number and sign. Visit <https://www.stlouiscountymn.gov/departments-a-z/sheriff/emergency/911-emergency#5143571-obtaining-a-911-address> for addressing information.

APPLICANT (Property Owner)

Name **Adam Ryan** Date **5/10/2024**

Address **10440 Highway 92** City **Hibbing** State **MN** Zip **55746**

Email Phone **218-969-2878** Phone

CONTACT (If Different than Applicant Above)

Name

Email Phone Phone

MAILING INFORMATION (If Different than Site Address)

US Mail Address City State Zip

Email Email **michaelbodri@gmail.com**

REASON FOR APPLICATION

New SSTS Replacing the Existing SSTS **Why failed, want to add on** Point of Sale Requirement

SYSTEM TYPE (refer to design summary) and [PERMIT FEES](#)

Type I		Type II		Type III		Type IV		Type V	
<input type="checkbox"/> Non-Shoreland	\$325	<input type="checkbox"/> Holding Tank	\$270	<input type="checkbox"/> System	\$365	<input checked="" type="checkbox"/> System	\$420	<input type="checkbox"/> System	\$525
<input type="checkbox"/> Shoreland	\$565	<input type="checkbox"/> Privy/Outhouse	\$110	<input type="checkbox"/> Component Add/Replace	\$215	<input type="checkbox"/> Component Add/Replace	\$215	<input type="checkbox"/> Component Add/Replace	\$215
<input type="checkbox"/> Component Add/Replace	\$215	<input type="checkbox"/> Floodplain-Shoreland	\$330						
		<input type="checkbox"/> Component Add/Replace	\$215						

Please make checks payable to: St. Louis County Auditor

SITE INFORMATION (Check all that apply)

Yes No Is the SSTS within 1,000 feet of a lake or 300 feet of a river? **Lake/River Name Vermilion**

Yes No Is the property used year round?

Yes No Is the property part of a CIC (Common Interest Community)? If yes, include the Associated PIN on this Application.

Yes No Is this property serving multiple dwellings sharing a SSTS component?

Yes No Is this leased property? If yes, you must obtain & attach the Lessor's written authorization for this project.

Leased From MN Power St. Louis County MN DNR US Forest Service Other

WELL INFORMATION (Check all that apply)

Water Source Proposed Well Existing Well Hand Carried Surface/Lake Water Municipal

Well Type Drilled Sandpoint Dug More than one well? Yes No

Well # Well Depth Feet Case Depth Feet



St. Louis County, MN

PERMIT

Residential Construction Application

Subsurface Sewage Treatment System

Form

3000

Rev. 01-02-2024

DESIGNER

Licensed Business Name **Bodri Enterprises Inc.**

License # **4284**

Certification # **8748**

Designer's Comments *(To Onsite Wastewater Staff)*

Current system is failed, need a new system in order to add on

STRUCTURE

Building Type and Water Uses Check all that apply		# of Bedrooms	Seasonal Use Only	Plumbing	Basement Plumbing	Garbage Disposal	Clothes Washer	Dishwasher	Water Conditioning Unit	Furnace w/Humidifier	Bathtub > 40 gal	Sewer Grinder Pump
<input checked="" type="checkbox"/> Dwelling	Home, mobile home, hunting shack, cabin, RV	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Multi-Family	Multiple units		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Accessory Dwelling	Guest cottage, bunk house		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Accessory Structure	Garage, pole building, shed, sauna, gazebo screen-house	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other information to be considered for this application

AGREEMENT

By submitting this application, the entire contents of which are considered to be public data, I certify and agree that I am the owner or the authorized agent of the owner of the above property, and that all uses will conform to the provisions of St. Louis County. I further certify and agree that I will comply with all conditions imposed in connection with the approval of the application. Applicants may be required to submit additional property descriptions, property surveys, site plans, building plans and other information before the application is accepted or approved. **Intentional or unintentional falsification of this application or any attachments thereto will make the application, any approval of the application and any resulting permit invalid.** I authorize St. Louis County staff to inspect the property to review the application and for compliance inspections. Furthermore, by submitting this application, I release St. Louis County and its employees from any and all liability and claims for damages to person or property in any manner or form that may arise from the approval of the application or any related plans, the issuance of any resulting permit or the subsequent location, construction, alteration, repair, extension, operation or maintenance of the subject matter of the application.

CONTACT Planning and Zoning (Onsite Wastewater Division)

Duluth Office

Government Services Center
320 W 2nd Street, Suite 301
Duluth, MN 55802

Phone (218) 471-7103
Toll Free (800) 450-9777
www.stlouiscountymn.gov/septic

Virginia Office

Government Services Center
201 South 3rd Avenue West
Virginia, MN 55792

Phone (218) 471-7103
Toll Free (800) 450-9777
www.stlouiscountymn.gov/septic

OFFICE USE ONLY

Amount Paid	Paid by	Cash	Check #	Permit #
Revenue Code	Received By	<input type="checkbox"/> Mail <input type="checkbox"/> IP	Date RIO	



St. Louis County, MN

PERMIT

SSTS Design Summary

Subsurface Sewage Treatment System

Form

3002

Rev. 01-02-2024

This form is used to complete a SSTS Design. Additional Information: www.stlouiscountymn.gov/septic

SITE INFORMATION

Site Address 4301 Isle of Pines Dr	City Tower	Zip 55790	Parcel ID 387-0215-00010
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DESIGNER

Name Michael Bodri	Date 5/21/2024
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Email michaelbodri@gmail.com	Phone 218-410-3477	Phone
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SYSTEM INFORMATION

MPCA Type	<input type="checkbox"/> Type I	<input type="checkbox"/> Type II	<input type="checkbox"/> Type III	<input checked="" type="checkbox"/> Type IV	<input type="checkbox"/> Type V	Dwelling Classification	<input type="checkbox"/> I	<input checked="" type="checkbox"/> II	<input type="checkbox"/> III	<input type="checkbox"/> IV
-----------	---------------------------------	----------------------------------	-----------------------------------	---	---------------------------------	-------------------------	----------------------------	--	------------------------------	-----------------------------

<input checked="" type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Seasonal	<input type="checkbox"/> Other	Well Casing Depth
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# Bedrooms 2	# Water using devices 2	Total Finished Sq ft 1580	Sq ft / Bedroom 790
---------------------	--------------------------------	----------------------------------	----------------------------

Design Flow 225	Water Meter	Pressure Test no	Grinder or Disposal no
------------------------	-------------	-------------------------	-------------------------------

CLR 6	SLR 0.6	Limiting Soil Type redox	Limiting Layer Depth (in) 14
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SSTS Flow Description

A 2 bedroom class II cabin to a 1000 septic and a 1000 pump tank. This goes to a 6x38' rock bed with 12" of sewer sand underneath.

TANK INFORMATION

Type (Septic, Pump, Holding etc.)	Size (gallons)	Status (New, Existing)	Material (Precast, Plastic)	Alarm (Yes, No)	Insulated (Yes, No)	Bedded (Yes, No)	Building Sewer (Gravity, Pressure, Both)
Septic	1000	New	Precast	yes	**	yes	gravity
Pump	1000	New	Precast	yes	**	yes	gravity

Gallons per inch of pump tank	33.8
-------------------------------	-------------

Tank Installation & Pumping comments

**** If tank is buried less than 2 feet underground, then both the riser lids and top of tank must be insulated to a value of at least R10. 1000 gallon low pro tanks are going to be used because of the shallow amounts of soil in the area.**

DISTRIBUTION INFORMATION

<input type="checkbox"/> Gravity	<input type="checkbox"/> Drop Box	<input type="checkbox"/> Distribution Box
----------------------------------	-----------------------------------	---

<input checked="" type="checkbox"/> Pressure	Gal/Min 40	Ft Head 21	Pump Model Goulds PE 51 or equivalent
--	-------------------	-------------------	--

<input type="checkbox"/> Event Counter	<input type="checkbox"/> ETM	Time Dose Panel SJE Rhombus	Timer On 0.64 min	Timer Off 2 hours
--	------------------------------	------------------------------------	--------------------------	--------------------------

Max Dose	Min. Dose	Drainback 7	Dose + Drainback 26	Float Tether (in)
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Manifold

Laterals

Location <input checked="" type="checkbox"/> Center	<input type="checkbox"/> End	Number	Length (ft)
---	------------------------------	--------	-------------

Size (in) 2	Size (in)
--------------------	-----------

Insulated no	Orifices
---------------------	----------

Size (in)	# Per lateral
-----------	---------------

Spacing (in)	Shields
--------------	---------



St. Louis County, MN

PERMIT

SSTS Design Summary

Subsurface Sewage Treatment System

Form

3002

Rev. 01-02-2024

DRAINFIELD INFORMATION				
Trench				
Number	Width (ft)	Length (ft)	Media Type	
Max Depth (in)	Rock (in)	Cover (in)	Sand Liner (in)	
Bed				
Number	Width (ft)	Length (ft)	Media Type	
Max Depth (in)	Rock (in)	Cover (in)	Sand Liner (in)	
At-Grade				
Width (ft)	Length (ft)	Number	Up Berm (ft)	Down Berm (ft)
Mound				
Number	Bed Width (ft)	Bed Length (ft)	Media Type	
Sand (in) to	Rock (in)	Cover (in)	Total Width (ft)	
Up Berm (ft)	Down Berm (ft)	Sand (yd ³)	Total Length (ft)	
Registered Filter Product				
Filter Class	<input checked="" type="checkbox"/> Intermittent/Single Pass	<input type="checkbox"/> Recirculating	<input type="checkbox"/> Subsurface Flow	<input type="checkbox"/> Other
Media Type	<input type="checkbox"/> Sand	<input checked="" type="checkbox"/> Peat	<input type="checkbox"/> Textile/Synthetic	<input type="checkbox"/> Constructed Wetlands
No. of Filters	2	Rock Bed Dimensions (ft)	6 x 38	Bed Media Depth (in)
Manufacturer	Anua Puraflow			
Registered Aerobic Treatment System				
Type	<input type="checkbox"/> Suspended Growth	<input type="checkbox"/> Fixed Film	<input type="checkbox"/> Sequencing Batch	<input type="checkbox"/> Other
Gallons/day	No. of Units	Disinfection (yes or no)	If yes, chemical or UV	
Manufacturer				
Designer Comments				
If pipes are to be run in any areas where foot or vehicle traffic is expected in the winter, insulating these lines is highly recommended.				
CONTACT Planning and Zoning (Onsite Wastewater Division)				
Duluth Office		Virginia Office		
Government Services Center 320 W 2nd Street, Suite 301 Duluth, MN 55802	Phone (218) 471-7103 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic	Government Services Center 201 South 3rd Avenue West Virginia, MN 55792	Phone (218) 471-7103 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic	

OSTP Soil Observation Log

Project ID:

v 03.19.15



Client/ Address:		Adam Ryan 4301 Isle of Pines Dr.		Legal Description/ GPS:		387-0215-00010	
Soil parent material(s): (Check all that apply)							
<input type="checkbox"/> Summit		<input type="checkbox"/> Outwash		<input type="checkbox"/> Loess		<input type="checkbox"/> Bedrock	
<input type="checkbox"/> Shoulder		<input type="checkbox"/> Lacustrine		<input type="checkbox"/> Till		<input type="checkbox"/> Organic Matter	
<input type="checkbox"/> Back/Side Slope		<input type="checkbox"/> Foot Slope		<input type="checkbox"/> Toe Slope		Slope shape	
Landscape Position: (check one)		Soil survey map units		F5B		LL	
Vegetation		Red/white pine, birch		Slope%		Elevation: 1372'	
Weather Conditions/Time of Day:		sunny, 2 pm		Date		04/25/24	
Observation #/Location:		Hole 1		Observation Type:		Soil Pit	
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure-----
0-10	Sandy Loam	35-50%	10YR 3/2				Shape: Blocky Grade: Moderate Consistence: Firm
10-14	Fine Sandy Loam	35-50%	10YR 4/6				Blocky Moderate Firm
14-17	Sandy Loam	35-50%	10YR 4/6	7.5YR 4/6	Concentrations		Blocky Moderate Firm
Comments							
Hole closest to the original cabin							
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.							
Michael Bodri		Michael Bodri		4284		#REF!	
						5/10/2024	

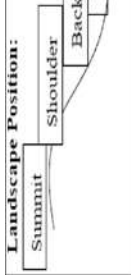
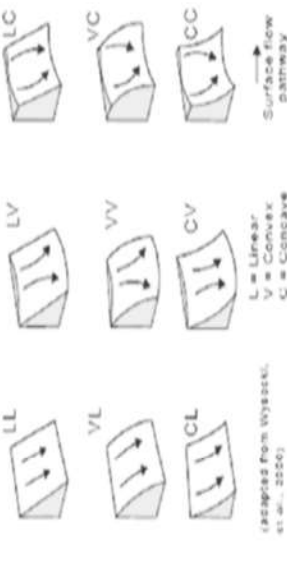
Additional Soil Observation Logs

Project ID: #REF!

Client/ Address:		Adam Ryan 4301 Isle of Pines Dr.		Legal Description/ GPS:		387-0215-00010	
Soil parent material(s): (Check all that apply)							
<input type="checkbox"/> Summit		<input type="checkbox"/> Shoulder		<input type="checkbox"/> Back/Side Slope		<input type="checkbox"/> Foot Slope	
<input type="checkbox"/> Outwash		<input type="checkbox"/> Lacustrine		<input type="checkbox"/> Loess		<input type="checkbox"/> Till	
<input type="checkbox"/> Alluvium		<input type="checkbox"/> Bedrock		<input type="checkbox"/> Organic Matter			
Landscape Position: (check one)							
<input type="checkbox"/> red pine, birch		<input type="checkbox"/> Soil survey map units F5B		<input type="checkbox"/> Slope%		<input type="checkbox"/> Elevation:	
				5.0		1372'	
Weather Conditions/Time of Day:							
		sunny, 2pm		Date		02/25/24	
Observation #/Location:							
		hole 2		Observation Type:		Soil Pit	
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure----- Shape Grade Consistence
0-12	Sandy Loam	35-50%	10YR 2/2				Blocky Moderate Firm
12-15	Sandy Loam	35-50%	10YR 4/6				Blocky Moderate Firm
Comments							
Hit large rock at 15" that ic ould not get around with the shovel							

Observation #/Location:							
		hole 3		Observation Type:		Soil Pit	
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure----- Shape Grade Consistence
0-2	Sand	<35%	10YR 3/3				Single grain Structureless Loose
2-15	Sand	<35%	10YR 4/4				Single grain Structureless Loose
15-17	Sandy Loam	35-50%	10YR 3/3				Blocky Moderate Firm

Comments	Hole closest to the lake. Owner said there used to be a large pine here at one point. When the tree blew over, the hole it left was filled with sand.
----------	---

<p>Textures:</p> <ul style="list-style-type: none"> c-clay sic-silty clay sc-sandy clay cl-clay loam si-cl-silty clay loam sc-l-sandy clay loam si-silt sil-silt loam l-loam sl-sandy loam* ls-loamy sand* s-sand* 	<p>Subsoil Indicator(s) of Saturation:</p> <ul style="list-style-type: none"> S1. Distinct gray or red redox features S2. Depleted matrix (value >/=4 and chroma </=2) S3. 5Y chroma </= 3 S4. 7.5 YR or redder faint redox concentrations or redox depletion 	<p>Consistence:</p> <ul style="list-style-type: none"> Loose- Intact specimen not available Friable- Slight force between fingers Firm- Moderate force between fingers Extremely firm- Moderate force between hands or slight foot pressure Rigid- Foot pressure
<p>If yes to one of the above indicators then:</p> <p>Topsoil Indicator(s) of Saturation:</p> <ul style="list-style-type: none"> T1. Wetland Vegetation T2. Depressional Landscape T3. Organic texture or organic modifiers T4. N 2.5/ 0 color T5. Redox features in topsoil T6. Hydraulic indicators 	<p>*Sand Modifiers</p> <ul style="list-style-type: none"> co-coarse m-medium f-fine vf-very fine 	<p>Slope Shape:</p> <p>Slope shape is described in two directions: up and down slope (perpendicular to the contour), and across slope (along the horizontal contour); e.g. Linear, Convex or LV.</p>
<p>Soil Structure</p> <p>Grade:</p> <ul style="list-style-type: none"> Massive- No observable aggregates, or no orderly arrangement of natural lines of weakness Weak- Poorly formed, indistinct peds, barely observable in place Moderate- Well formed, distinct peds, moderately durable and evident, but not distinct in undisturbed Strong- Durable peds that are quite evident in un-displaced soil, adhere weakly to one another, withstand displacement, and become separated when soil is disturbed Loose- No peds, sandy soil 	<p>Landscape Position:</p> 	
<p>Soil Structure</p> <p>Shape:</p> <ul style="list-style-type: none"> Granular- The peds are approximately spherical or polyhedral and are commonly found in topsoil. These are the small, rounded peds that hang onto roots Platy- The peds are flat and plate like. They are oriented horizontally and are usually overlapping. Platy structure is commonly found in forested areas Blocky- The peds are block-like or polyhedral, and are bounded by flat or slightly rounded surface that are casting of the faces of surrounding peds. Prismatic- Flat or slightly rounded vertical faces bound the individual peds. Peds are distinctly longer vertically, and faces are typically cast or molds of Single Grain- The structure found in a sandy soil. The individual particles are not held together. 		

Puraflo® & Dispersal Field Design Guide

Design Parameters	Design flow	225 gpd
	Occupancy	2 people
	Soil loading rate	0.60 gpd/ft ²
	Slope %	5%
	Depth to limiting layer	6 inches
	Req'd separation to limiting layer	18 inches
	Contour loading rate	6.0 gpd/ft
Dispersal option, req'd	Mound	

Septic Tank Sizing	Min (NSF model configuration), or Garbage Disp or Sewage Pump	250 gallons 370 gallons
	Septic tank size, req'd	1,000 gallons

Pump Tank Sizing	Min (NSF model configuration), or Use other min	250 gallons 1,000 gallons
	Pump tank size, req'd	1,000 gallons

Puraflo® Module Sizing	# Puraflo® modules	2 per flow loading
	# Puraflo® modules	1 per organic loading
	Puraflo® modules, req'd	2

Bed Design	Bed size multiplier	1.0
	Bed, W	10.0 ft
	Bed, L	37.5 ft
	Bottom area	375 ft ²

	Slope ratio	3 :1
	Absorption bed, W	10.0 ft
	Absorption bed, L	37.5 ft
	Absorption area	375 ft ²
	System, H	2.0 ft
	Upslope multiplier	2.61 Based on slope %
	Upslope, W	5.2 ft



DIRECTIONS: Fill-in cells highlighted **GREEN**, if applicable.

Project Information

Adam Ryan 4301 Isle of Pines Dr Tower

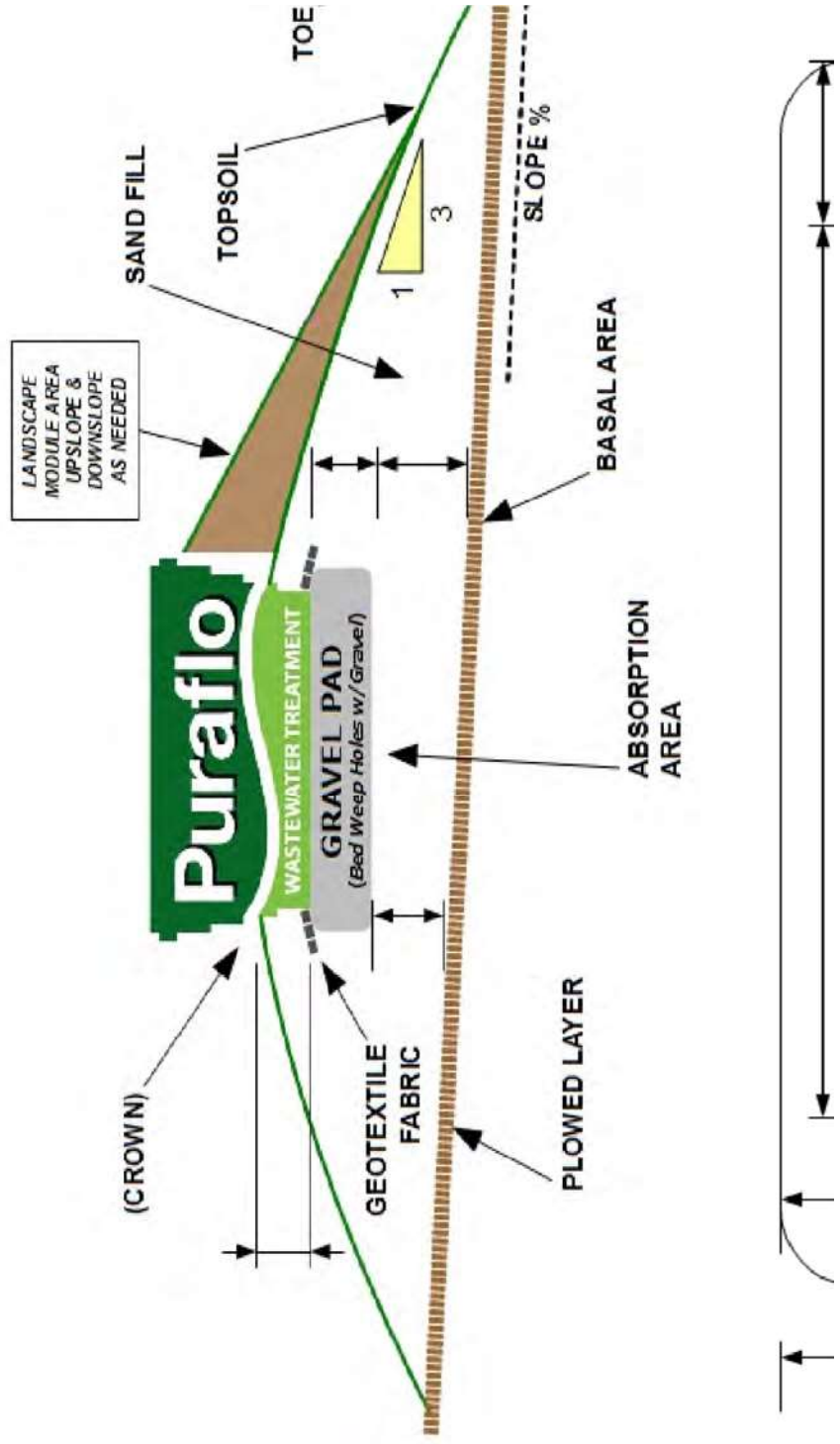
Slope ratio	3
Sand media loading rate	1.6
Mound absorption ratio	2.67
Dispersal bed, W	6.0
Dispersal bed, L	38.0
Dispersal bed area	141
Absorption area, W	16.0
Absorption, W (per slope %)	10.0
Clean sand lift/fill	1.00
Upslope, H	2.0
Upslope multiplier	2.61
Upslope, W	5.2
Bed elevation drop	3.6
Downslope, H	2.3

Mound Design

At-grade Design	Downslope multiplier	3.53	Based on slope %	3.53	Downslope multiplier	3.53
	Downslope berm, W	7.1 ft		7.1 ft	Downslope berm, W	8.1
	Min downslope berm cover	5.0 ft		5.0 ft	Min downslope berm cover	5.0
	Downslope, W	15.0 ft		15.0 ft	Downslope, W	15.0
	Endslope multiplier	3:1		3:1	Endslope multiplier	3
	Endslope, L	6.0 ft		6.0 ft	Endslope, L	6.9
	Total system, W	30.2 ft		30.2 ft	Total mound, W	26.2
	Total system, L	49.5 ft		49.5 ft	Total mound, L	51.8

Mound Diagram

NOTES: 1. NOT TO SCALE 2. MODULE DIMENSIONS: 7.08' L x 4.58' W x 2.5' H 3. DIMENSIONS: SIDE VIEW = FEET, TOP VIEW



TDH Calculations for Selecting System Pump

Assumes $f = 0.022$ for 2 inch pipe typical operating range
 Static Head in Feet = Measured/Estimated
 Friction Head in Feet = $(fL_v^2)/(2gD) = (2.1355 \times 10^{-5})LQ^2$ (Q in gpm, L in feet)
 Pressure Head in Feet = $0.10524(Q/\text{No. Mod.})^2$ (Q in gpm) from Orifice Equations

BOX 1.

Q (gpm)	# Modules	L (feet)	h_{stat} (feet)	h_f (feet)	h_p (feet)	TDH
0.0	2	111.00	9.00	0.00	0.00	9.00
10.0				0.24	2.63	11.87
20.0				0.95	10.52	20.47
30.0				2.13	23.68	34.81
40.0				3.79	42.10	54.89
50.0				5.93	65.78	80.70
60.0				8.53	94.72	112.25
70.0				11.61	128.92	149.53
80.0				15.17	168.38	192.55
90.0				19.20	213.11	241.31
100.0				23.70	263.10	295.80

BOX 2.

EQUIVALENT LENGTH ESTIMATE			
Element	2" Ftg. Eq. Length	Number	Eq. Length
Length	40.00	1.00	40.00
Reg. 90 deg	9.00	3.00	27.00
Reg. 45 deg	4.00	5.00	20.00
T (Diversion)	11.00	2.00	22.00
Coupling (Disconnect)	2.00	1.00	2.00
Check Valve	17.00	0.00	0.00
Ball Valve (fully open)	54.00	0.00	0.00
TOTAL EQ. LENGTH			111.00

BOX 3 - Programmable Timer Settings

Anticipated pump rate	40 gpm
Treatment design flow	225 gpd
Drainback volume per dose	7 gal.
Dosing Interval (pump rest time)	2.00 hrs.
Number of doses	12 d ⁻¹
Drainback volume per day	84 gpd
Pump design flow	309 gpd
Approx. volume per dose	26 gal.
Dose volume per module	9.38 gal.
Pump run time per dose	0.64 min.
Pump run time per dose	38.63 sec.
Tank volume (gal. per inch) ESTIMATE	34 gal. in. ⁻¹

From system versus pump curve for selected pump

From design flow for facility

Typically 2 hrs.

Treatment plus Drainback

Generally should not exceed 12.5 gallons - decrease dosing interval if necessary.

From pump tank dimensions or manufacturer's data

Draw down per dose*

0.8 in.

*Prior to drainback

Loss through drainback hole while pump is active is assumed to be negligible

INSTRUCTIONS:

1. ENTER THE NUMBER OF MODULES IN BOX 1.
2. ENTER THE STATIC HEAD IN BOX 1.
3. ENTER THE PIPE LENGTH IN BOX 2.
4. ENTER THE NUMBER OF FITTINGS IN BOX 2.
5. WITH ALL ABOVE ENTERED - PLOT TDH FROM BOX 1. ON PUMP CURVE
6. DETERMINE ANTICIPATED FLOW FROM PLOT
7. ENTER ANTICIPATED FLOW IN BOX 3.
8. ENTER DESIGN FLOW, DOSING INTERVAL AND TANK VOLUME PER INCH IN BOX 3.
9. ENTER PUMP TANK VOLUME (GAL/IN) BOX 3.

Septic System Maintenance Plan – Peat Filters

This management plan will identify the operation and maintenance activities necessary to ensure long term performance of your septic system. Some of these activities must be performed by you the homeowner. Other tasks must be performed by a licensed service provider or maintainer. However, it is YOUR responsibility to make sure that all tasks are accomplished in a timely manner. Keep copies of all pumping records and other maintenance/repair invoices with this document.

Property Owner: Adam Ryan

Property Address: 4301 Isle of Pines Dr. Tower

Permit #: Year installed:

Service provider/installer: Phone #:

Description of septic: A 2 bed class II home to a 1000 septic and 1000 pump tank. This goes to 2 peat filters with a 6x38' rock bed

Seasonally or several times per year – homeowner's responsibility

- Leaks. Check (listen, look) for leaks in toilets and dripping faucets. Repair all leaks promptly
- Surfacing sewage. Regularly check for wet/spongy soil around your soil treatment area. Surfaced sewage or strong odors that are not corrected by tank pumping or fixing broken caps, call your service professional. Untreated sewage can make animals and humans sick
- Alarms. Alarms signal when there is a problem with your system. Contact your maintainer any time the alarm signals. Test alarm yearly to make sure that it is working.
- Lint Filter. If you have a lint filter, check for lint buildup regularly and clean if necessary.
- Caps. Make sure that all caps and lids are intact and in place. Inspect for damaged caps and lids once every year in the fall. Fixing or replacing damaged caps/lids before winter can help prevent freezing issues.
- Effluent screens should be cleaned once a year. Screen can either be replaced or cleaned off by holding the screen over the open lid of the tank and spraying with a steady stream of water. Make sure that all of the water and debris removed is going back into your septic tank and not out onto the ground. Safety dictates always wearing gloves and safety glasses while completing this task. The effluent screen is located on the outlet side of the septic tank. Otherwise schedule a service provider or maintainer to complete this task.

Septic System Maintenance – homeowner, pumper/maintainer or service provider’s responsibility

Tank

- How frequently a septic tank should be cleaned depends upon the capacity of the tank, number of people using the system and number/type of water using appliances. Minnesota state rule requires assessment of every tank every three years, at the minimum.
- State recommends getting your tank pumped every 3 to 5 years or whenever the sludge and scum levels are at greater than 25% of the tank capacity.
- Make sure that your pumper pumps through the manhole, not the 4” or 6” diameter inspection port

Pump

- Pump and controls. Check to make sure that the pump and controls are operating correctly.
- Pump vault. Check to make sure that it is in place and clean per manufacturers recommendations.
- Alarm. Verify that the alarm works.
- Drain back. Check to make sure that everything is functioning properly.
- Event counter or etm. Check to see if there is an event counter or etm for the pump. Calculate the water usage and compare to the daily average flow.

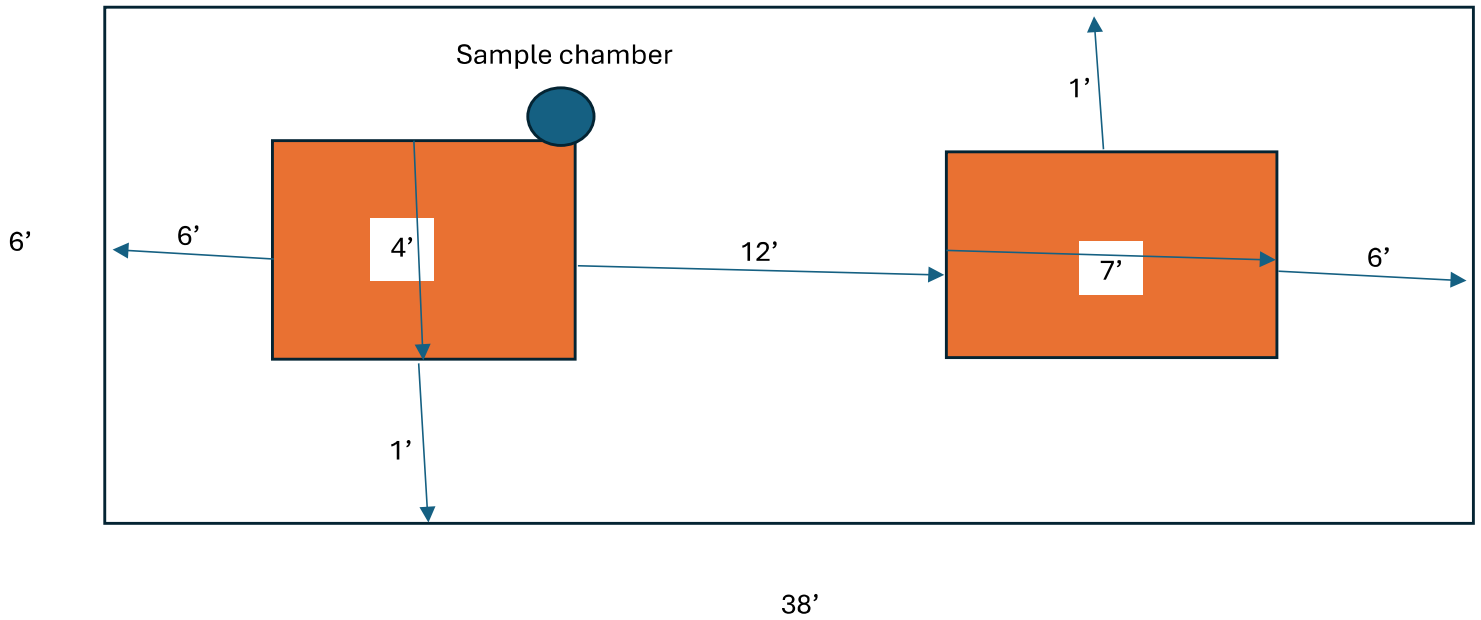
Soil Treatment Area

- Surfacing of effluent. Check for surfaced effluent or other signs of problems.
- Peat filter modules inspection – every year for manufacturer warranty or per county permit. Completed by licensed and approved service provider

Operating Permit

- Operating Permits must be renewed every three to five years per county permit. At the time of renewal, the owner must submit to the department an operating permit
 - Renewal application and application fee
 - All component operation and maintenance forms completed by the service provider.

Alternate site – need to have an alternate drain field area that is left undisturbed or replace the peat to start fresh.



Bring in the required 12" of sewer sand and level off the pad

Place a minimum of 6" of clean stone on top of the sewer sand (3/4-1")

Place peat filters on pad as listed above

Add pipe extender to spread out effluent

Cover exposed rock pad with geotextile fabric

Backfill and lightly compact cover material to top of filters



St. Louis County, MN

VARIANCE

Variance Worksheet

Subsurface Sewage Treatment System

Form

3090

Rev. 03-2021

About SSTS Variances Pursuant to Ordinance 61, Article V, Section 3.0

A property owner may request a variance from the standards specified in the Ordinance pursuant to county policies and procedures. Variances shall only be permitted when they are in harmony with the general purposes and intent of this Ordinance where there are practical difficulties or particular hardship in meeting the strict letter of this Ordinance, excluding the technical standards. Certain deviations may require the approval of the MPCA or the MN Department of Health.

Please Complete the Following Sections

Describe the specific provision or provisions in the ordinance from which the variance is requested.

A variance is being requested to allow for a septic system to be installed within 40' of the high water mark instead of the ordinary statute of 50' on lake Vermilion.

Describe the practical difficulty that prevents compliance with the rule.

The lot was platted in an irregular shape which makes staying away from the lake on two sides difficult. There is also a large amount of bedrock in the front yard, which eliminates a large portion from being able to have a septic.

Describe the alternative measures that will be taken to achieve a comparable degree of compliance with the purposes and intent of the applicable provisions.

By allowing the system to be closer to the lake, we would be able to maintain the proper setbacks to the neighbor's property line as well as the setbacks to the cabin. Without the variance, the system would have to become smaller and would encroach onto the neighbor's property line, as well as the cabin.

Identify cost considerations preventing reasonable use of the property under the terms of this ordinance.

The only other option for a system on this site would be to put in holding tanks either in the front or back yard. If this were to be a year around home, there would be significant pumping expenses accrued. Getting holding tanks in the front yard would also require blasting in order to get the tanks in.

AGREEMENT

By submitting this request for variance from the Ordinance and the Construction Standards, I certify and agree that no substantial health hazard is likely to occur therefrom and an unnecessary hardship might result in strict compliance with the Ordinance and Standards. I further agree to install a sewage treatment system in accordance with the permit application, plans, and specification that are made as part of this variance request, in addition to paying the Variance Fee associated with this request.

Site Design of Septic 5/2/2024

4301 Isle of Pines Dr.

Township: Greenwood

+/- 0.54 acres

City: Tower

Designed by Michael Bodri

Bodri Enterprises Inc.

License 4284 Cert 8748

218-410-3477

Proposed well

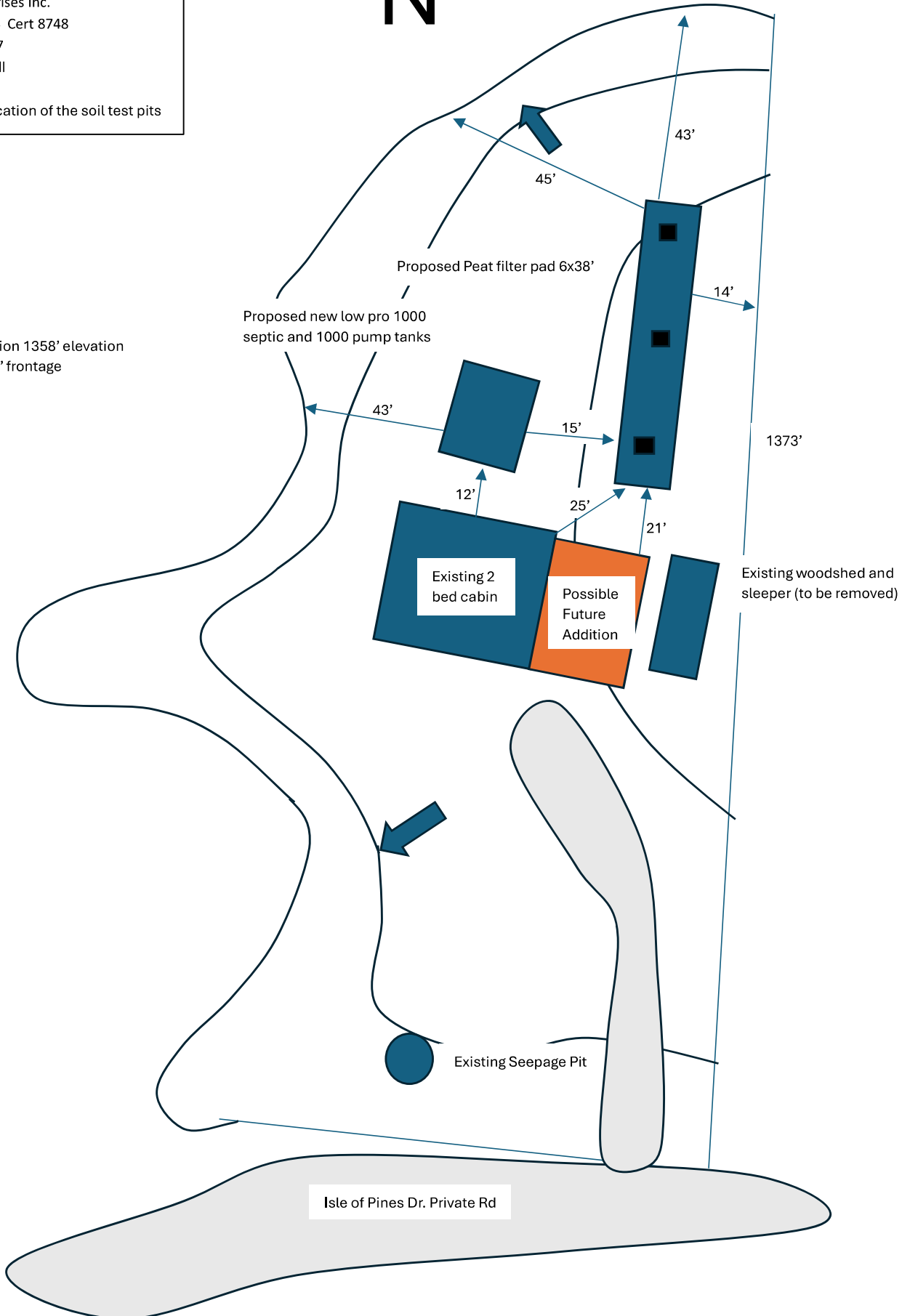
Not to scale

■ -The location of the soil test pits



Neighbor to the East has a lake water system as of 5/2/2024

Lake Vermilion 1358' elevation approx. 360' frontage





OPERATING PERMIT
OPERATING PERMIT WORKSHEET
 Subsurface Sewage Treatment System

Form
3010
 Rev. 01-02-2024

This form is for an operating permit. Additional Information: www.stlouiscountymn.gov/septic.

PROPERTY IDENTIFICATION NUMBER (PIN) and SITE

Primary PIN	3 8 7 - 0 2 1 5 - 0 0 0 1 0	Associated PIN													
Site Address	4301 Isle of Pines Dr				City	Tower		Zip	55790		Date	5/21/2024			

DESIGNER

Licensed Business Name	Bodri Enterprises Inc.	License #	4284
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REASON FOR OPERATION PERMIT

<input type="checkbox"/> Holding Tank	<input type="checkbox"/> Type III	<input checked="" type="checkbox"/> Type IV	<input type="checkbox"/> Type V
<input type="checkbox"/> Other Establishment	<input type="checkbox"/> High Strength Waste	<input type="checkbox"/> Other	

SYSTEM INFORMATION

Design flow	225	Treatment level	C
System components A 2 bed cabin to 1000 septic tank to 1000 pump tank to 2 peat filters			

MONITORING REQUIREMENTS (flows, pump calibration, timer settings, BOD, TSS, FOG, Fecal Coliform, etc.)

Parameter	Effluent limits	Frequency	Location
Pump Run Times	230 Min/month	MONTHLY	Panel
Event Counter	360/month	MONTHLY	Panel
Alarm		AS NEEDED	Tank

MAINTENANCE REQUIREMENTS

System component	Maintenance	Frequency
Effluent Filter	Clean	Annually
Alarm	Check if working	Annually
Operating Permit	Renew	Per County
Tanks	Pump	As Needed

OTHER INFORMATION

Run effluent samples for BOD, TSS and FOG if needed

SIGNATURE

<i>Michael Bodri (signed for Adam)</i>	Date	5/21/2024
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CONTACT Planning and Zoning (Onsite Wastewater Division)

Duluth Office		Virginia Office	
Government Services Center 320 W 2nd Street, Suite 301 Duluth, MN 55802	Phone (218) 471-7103 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic	Government Services Center 201 South 3rd Avenue West Virginia, MN 55792	Phone (218) 471-7103 Toll Free (800) 450-9777 www.stlouiscountymn.gov/septic